CUBE
BUILDING SERVICES
TECHNOLOGY PROGRAMME 2002–2006

Future Technical Building Services

Dr. Markku J. Virtanen

Finnish Development Centre for Building Services Ltd.

TEKES

Contents of the presentation

- **Background of the Finnish Building Services Technology Programme**
- **Brief overview of the programme - focuses of the development**
- **Some project items fitting to the scope of Annex 46**

Definition of Building Services

Building services is the entity of technical systems, equipment and services for real estate and related premises.

Building services produce controlled conditions for the functions needed in different premises, functions such as air conditioning, water supply and waste treatment, heat and electrity, lighting and ICT, security and transportation services.

CUBE
BUILDING SERVICES
TECHNOLOGY PROGRAMME 2002–2006

VISION 2010

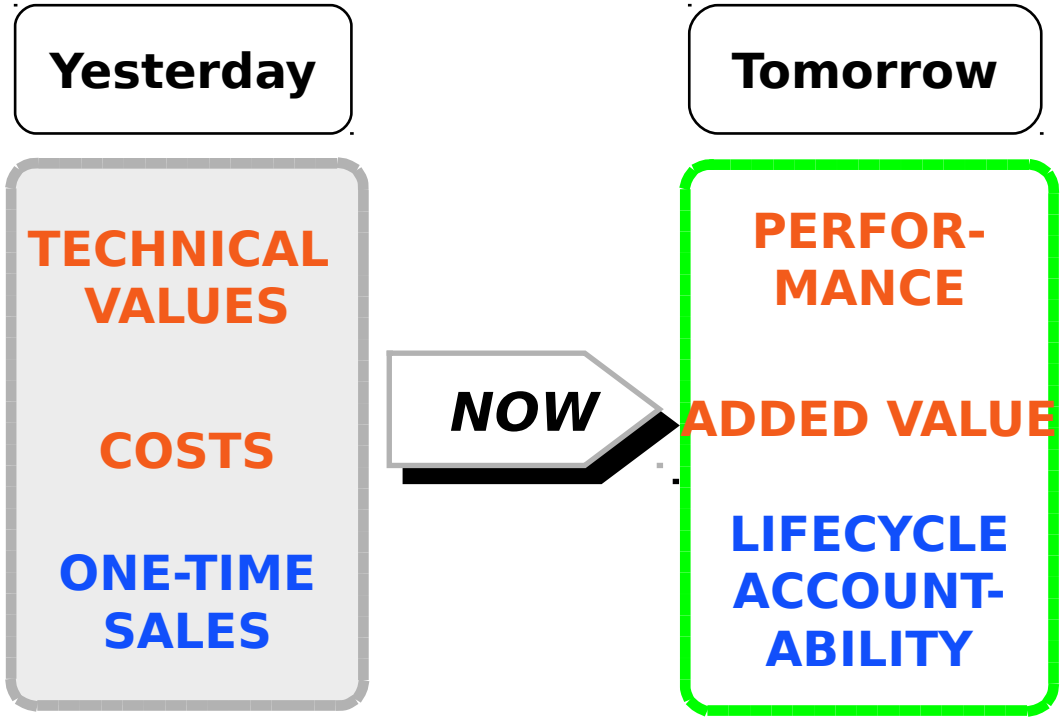
The Finnish Real Estate and Construction Cluster's vision for 2010

FOUNDATIONS FOR A GOOD LIFE

TEKES

4.2.05

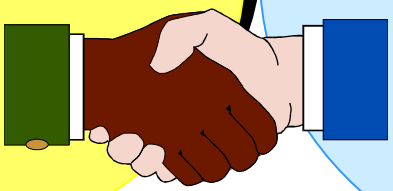
Changes in business environment



Partnership and networking

Customer = Building owners and users focus on their core business and thus improve

- user friendliness
- operating conditions
- energy efficiency
- comfort
- productivity
- user service



Building service suppliers = Total accountability for building services

- good indoor enviroment
- healthiness
- information technology
- safety
- adaptability
- energy efficiency
- reportability

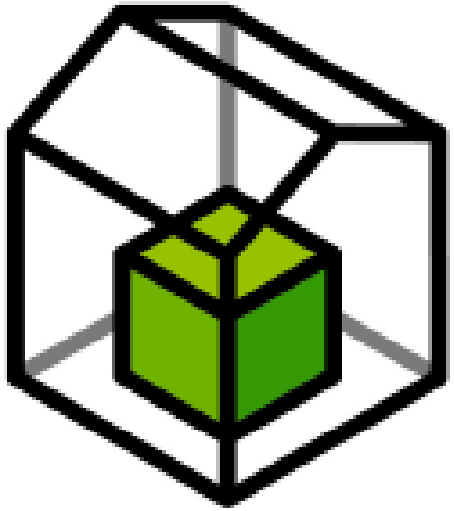
Cooperation

- partnership
- model agreements/ game rules
- shared benefits
- lifecycle economics
- needs/conditions
- environmental friendliness
- image

Real estate industry expertise
Professionals

Building services expertise

TEKES



CUBE

BUILDING SERVICES
TECHNOLOGY PROGRAMME 2002–2006

TEKES

Values of the technology programme

Connects technology and players

User is the payer and the king

Building owner is also

earning money

Environmental

responsinbility

CUBE

TEKES

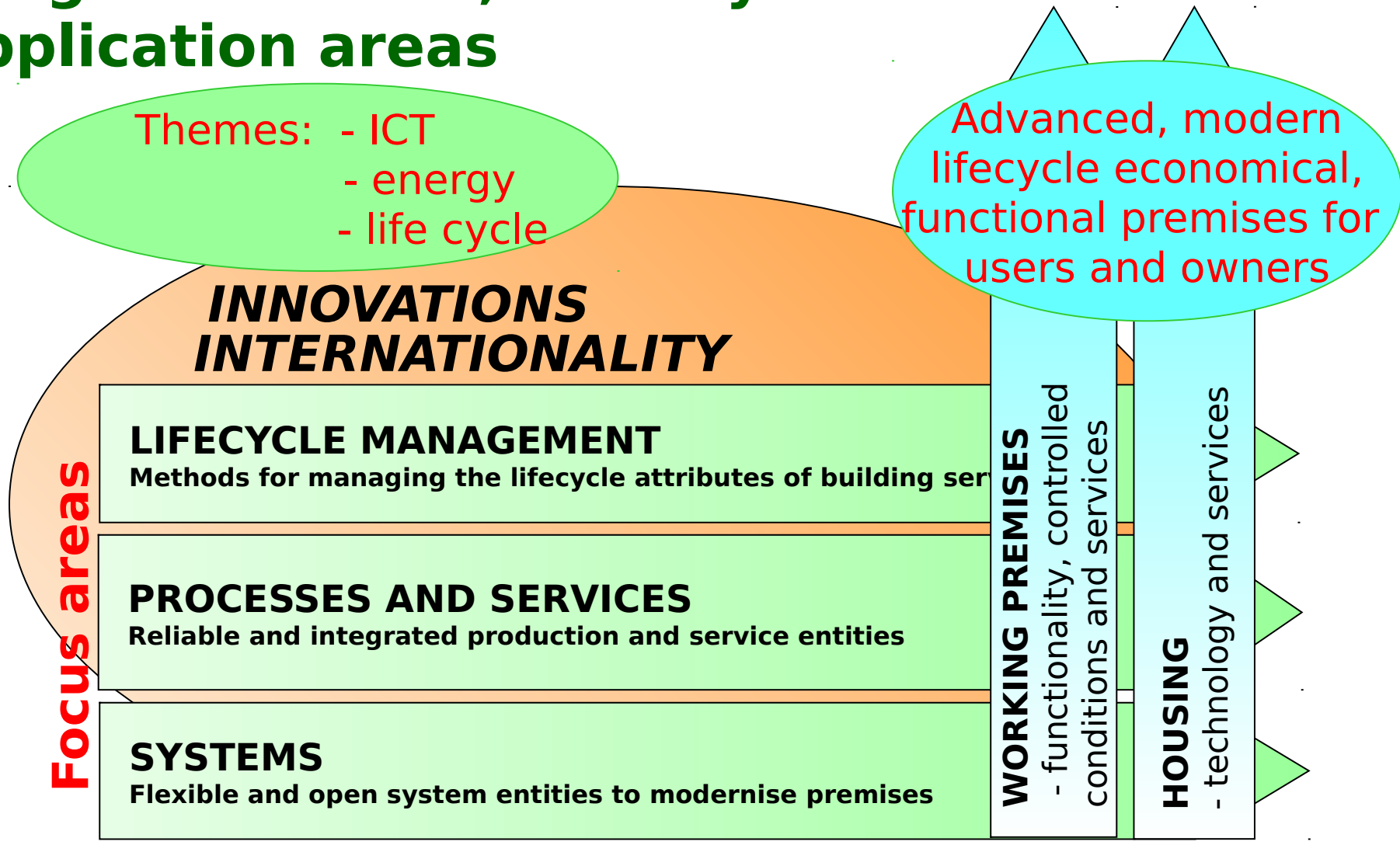
Goals of the technology programme

- **Strengthen service capacity of building services in the real estate business**
  - **by making available to users the appropriate premises with a focus on updating existing real estate**
  - **by producing added value for real estate owners through lifecycle economics and functional premises**

- **Develop internationally competitive building service products for living and working premises**
  - **by utilizing innovations in information, communication and energy technologies**

CUBE
BUILDING SERVICES
TECHNOLOGY PROGRAMME 2002–2006

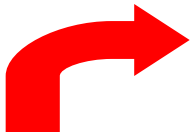
Program themes, activity focuses and application areas



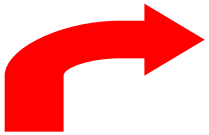
TEKES

Road Map for Business Operations

Easy living for customers



Service Solution



Total Technical Solutions

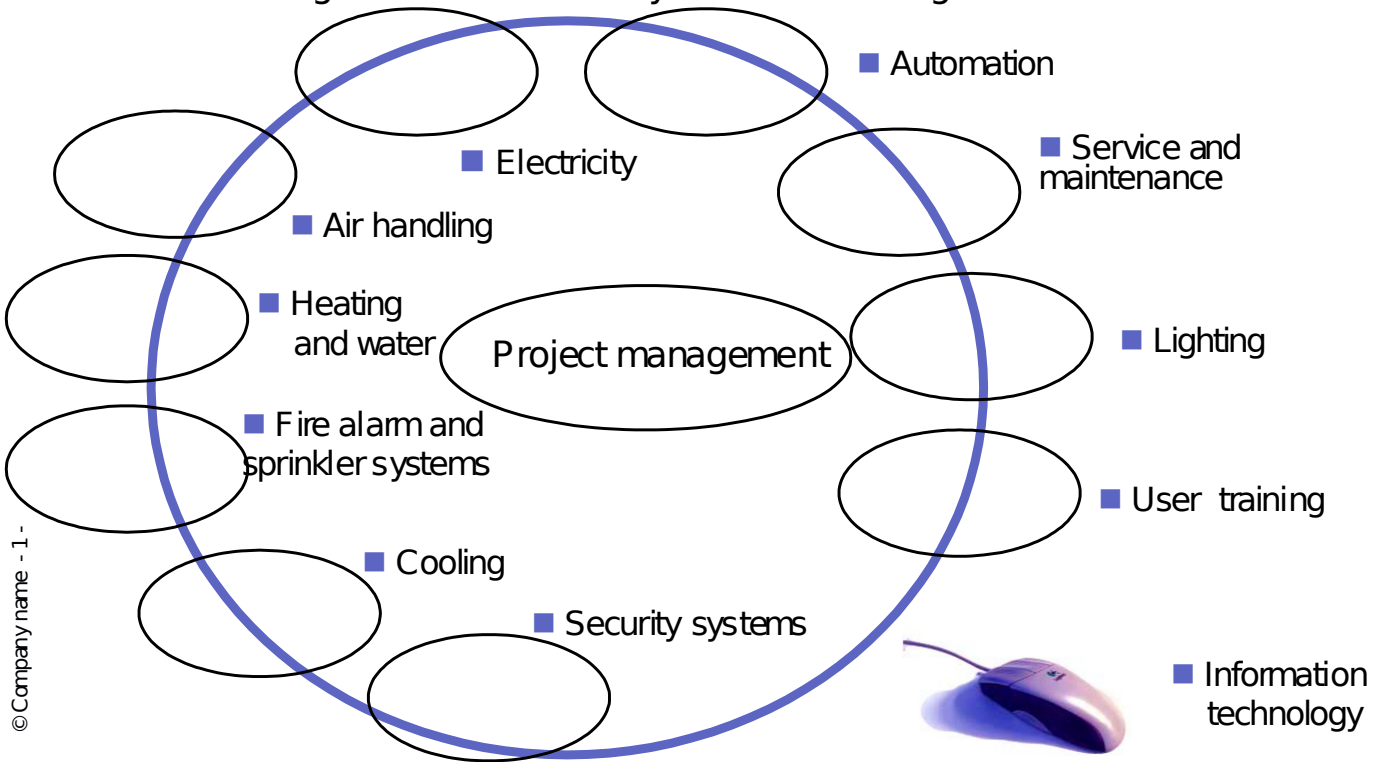
Products

Challenges for service supplie

TEKES

Total Technical Solutions

- Total Technical Solutions operates as a complete and flexible whole with technical services and systems connected to it
- Total Technical Solutions provides user friendly, functional and secure surroundings for the whole life cycle of the building

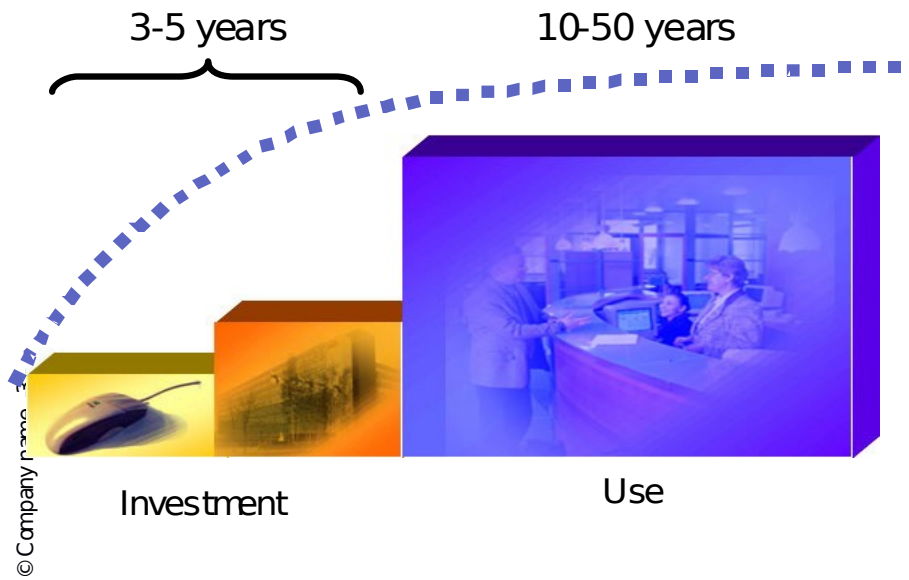


© Company name - 1 -

TEKES

Life Cycle Delivery

- Life cycle delivery work is closely developed with the customer to secure added and growing value to the building
- The largest part of the total costs arises during the use of the building



© Company name

Life Cycle Delivery

Added value of life cycle delivery:

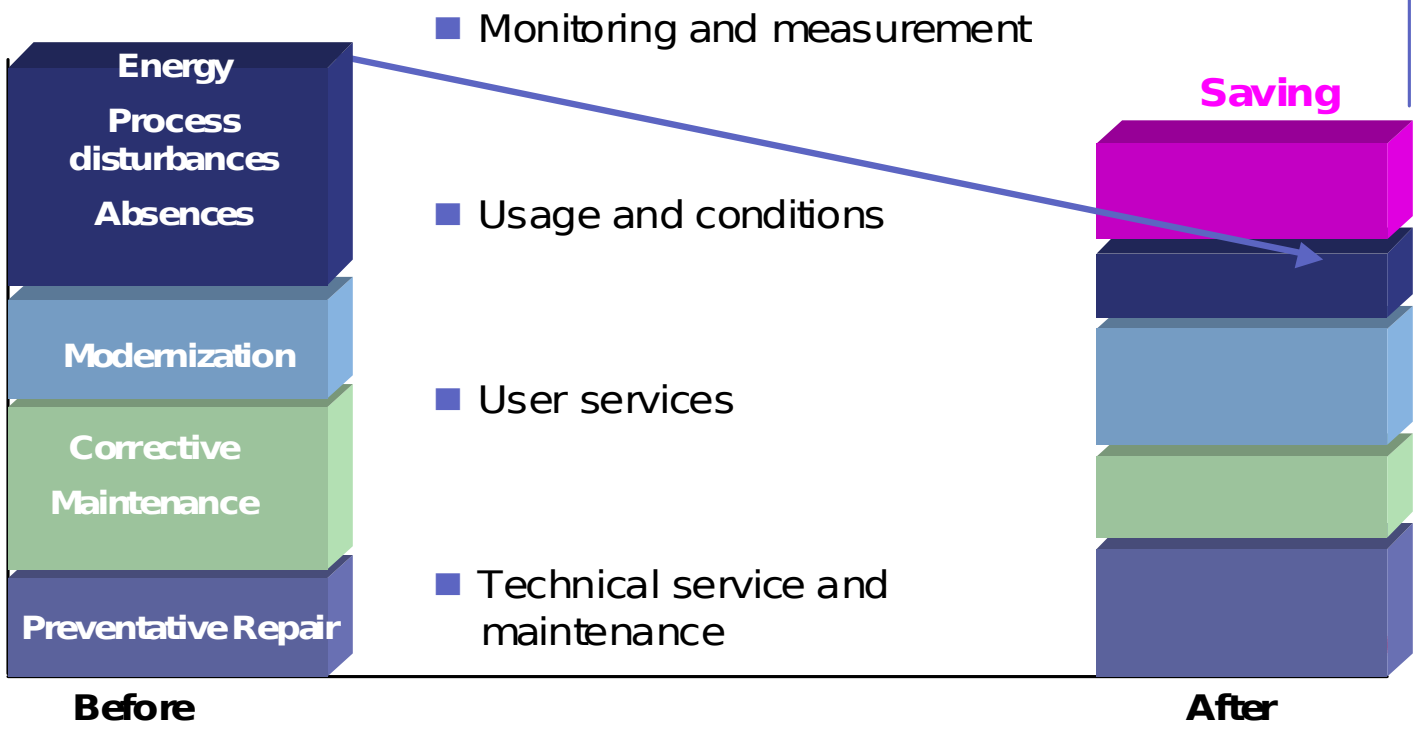
- **Control of costs through the whole life cycle**
- **Increased work productivity**
- **Flexibility for conversion of space**
- **Added value for facility**
- **Financing possibilities**
- **Environmental alertness**

© Company name

TEKES

Facility Management

- Facility Maintenance and Facility Management



© Company name 5 -

TEKES

Benefits to the customer

Owner

User

Work productivity

Increase in property value

Environmentally friendly

Energy control

Serviceability

Total Technical Solutions Life Cycle Delivery

Environment control

Efficient space

Flexible space

Security

Services

Comfort of people

TEKES

Technology programme today

From the beginning of 2002 has been started 79 research and development projects

- **19 public research projects**
- **60 industry driven development projects**

The volume of projects is 33,0 million Euros (Tekes funding 50 %)

Tekes funding for public research projects is 6,0 million Euros

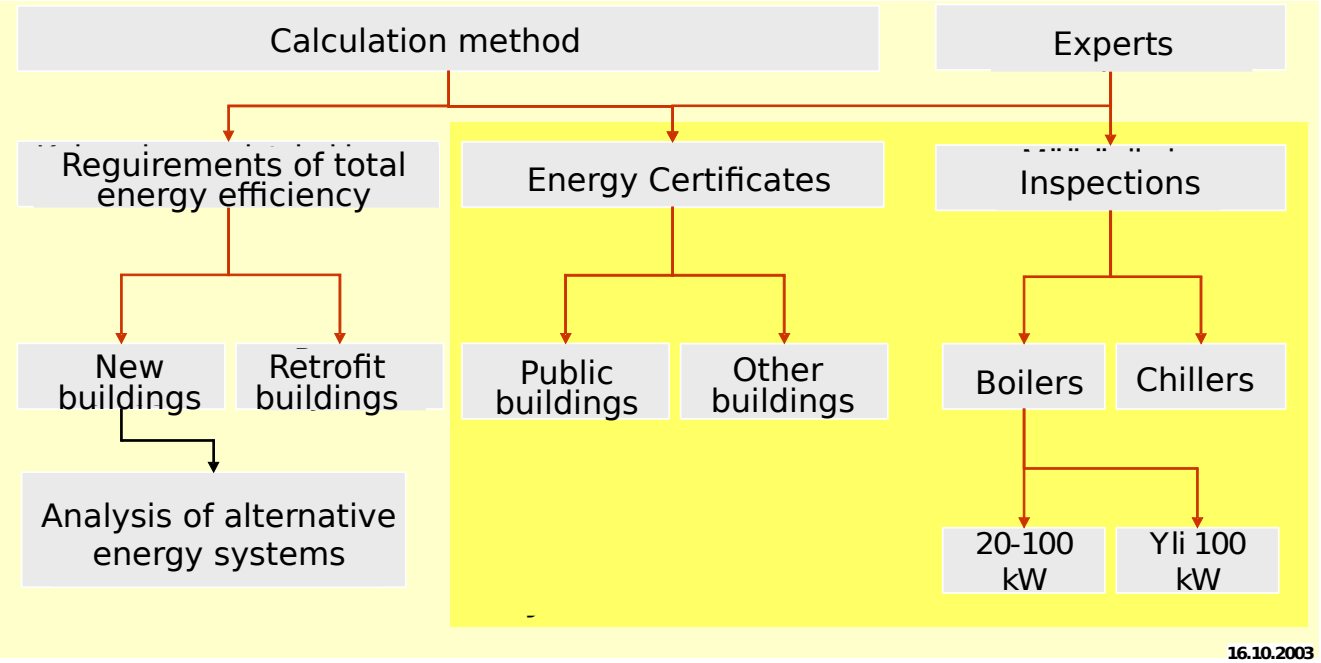
About 200 companies and 10 research organizations involved in the projects

TEKES

Projects fitting to the scope of Annex 46

Target setting and calculation of the total energy efficiency of buildings

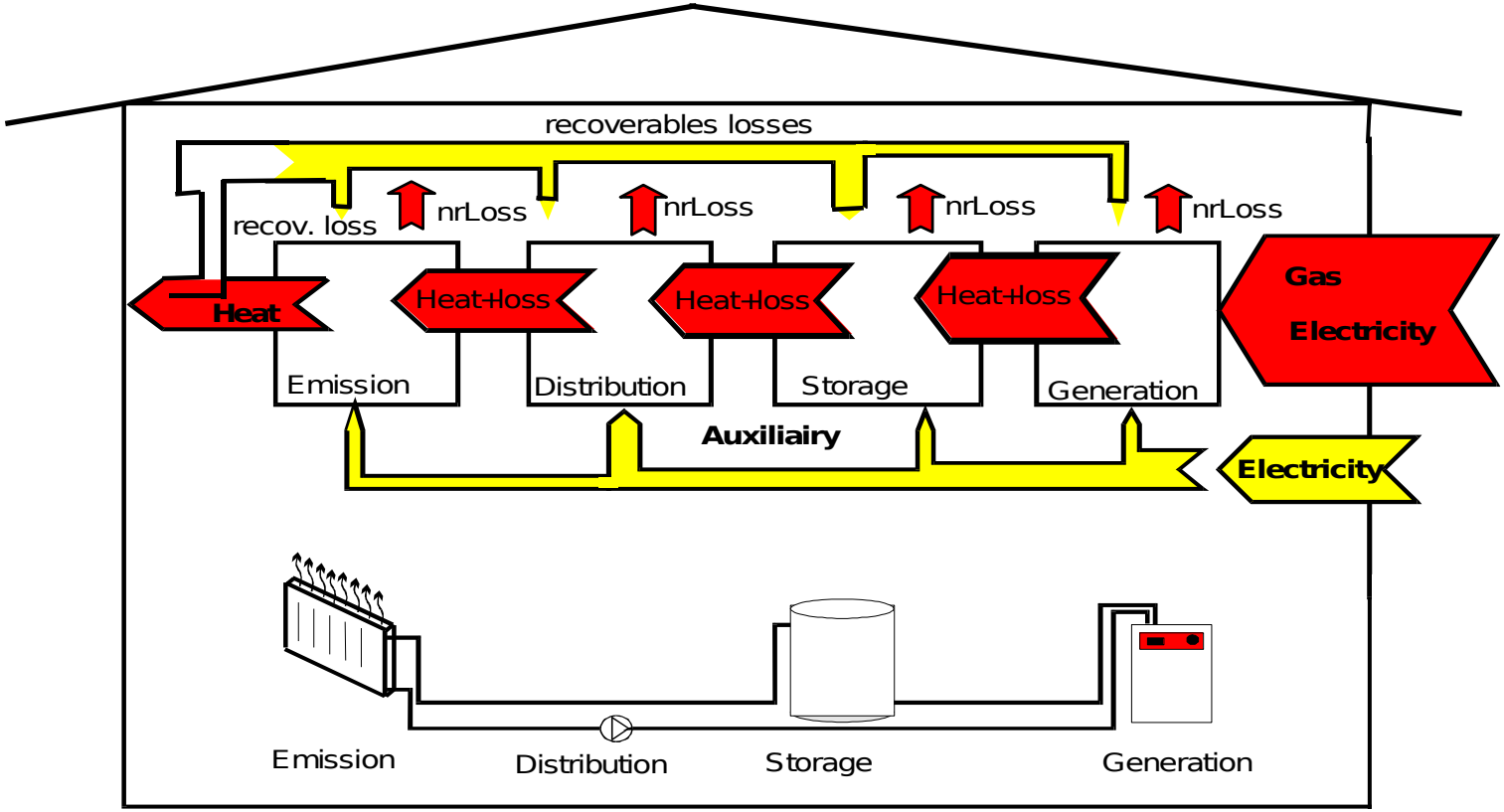
European Commission's Energy Efficiency Directive



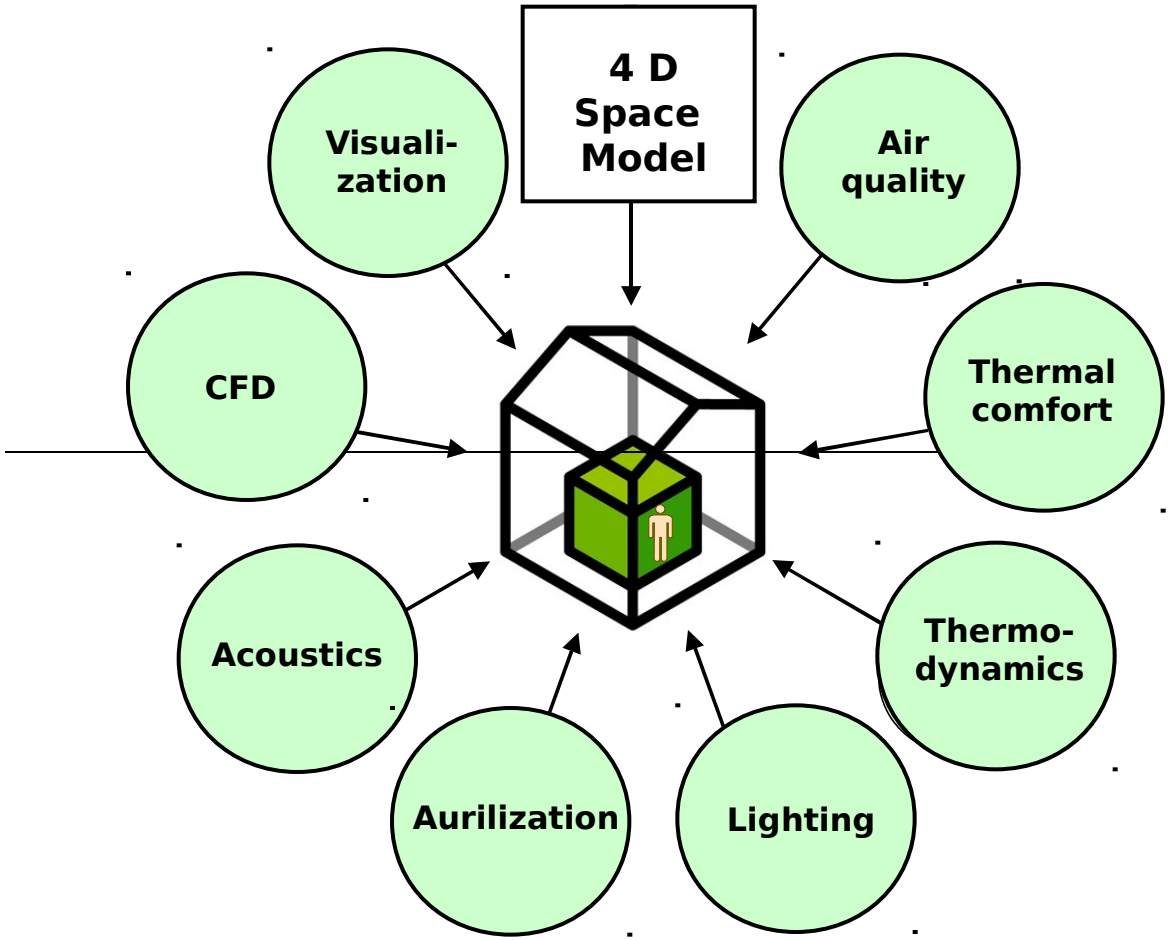
TEKES

Building envelope and building service system is an entity

From partial optimization to total optimization



Virtual Space 4D – Simulation and visualization of indoor environment



CUBE
BUILDING SERVICES
TECHNOLOGY PROGRAMME 2002–2006

Virtual Space 4D – examples of visualization

Draught area

Sound pressure levels

TEKES

CUBE
BUILDING SERVICES
TECHNOLOGY PROGRAMME 2002–2006

Commissioning of performance characteristics and energy efficiency of buildings

Commissioning means a systematic process guaranteeing that a building performs as designed and required by the functional needs of users

The project developes:

- **a systematic commissioning process (what, when and how)**

- **analysis methods and tools to be used in a commissioning process during different phases of the life-cycle of buildings and their building service systems**

- **applications of the methods can be either manual or automated.**

TEKES

CUBE
BUILDING SERVICES
TECHNOLOGY PROGRAMME 2002–2006

Life Cycle Building Services of the Future

The goal of the research project is

- to develop basis for life cycle services including contents of services, contract models, validation of service performances, risk management methods, new logics for making business,... and

- to support enterprises in their business driven development and piloting projects

- to develop different concepts and processes to produce life cycle services such as total life cycle delivery of technical system entities and their maintenance services, energy performance contracting services for building applications to be updated etc

- to develop acquisition processes to improve the availabilty and accessability of such services from the point of view of building owners

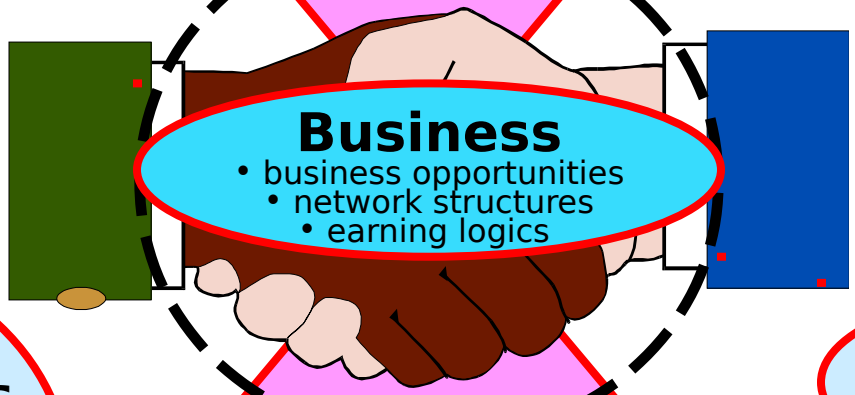
TEKES

CUBE
BUILDING SERVICES
TECHNOLOGY PROGRAMME 2002–2006

Market pull

Acquisition processes of services

Building services



Business
- business opportunities
- network structures
- earning logics

Real estate management

Contract models
- partnerships
- responsibilities
- .
- .
- .

Risk management
- economical
- technical

Performance validation

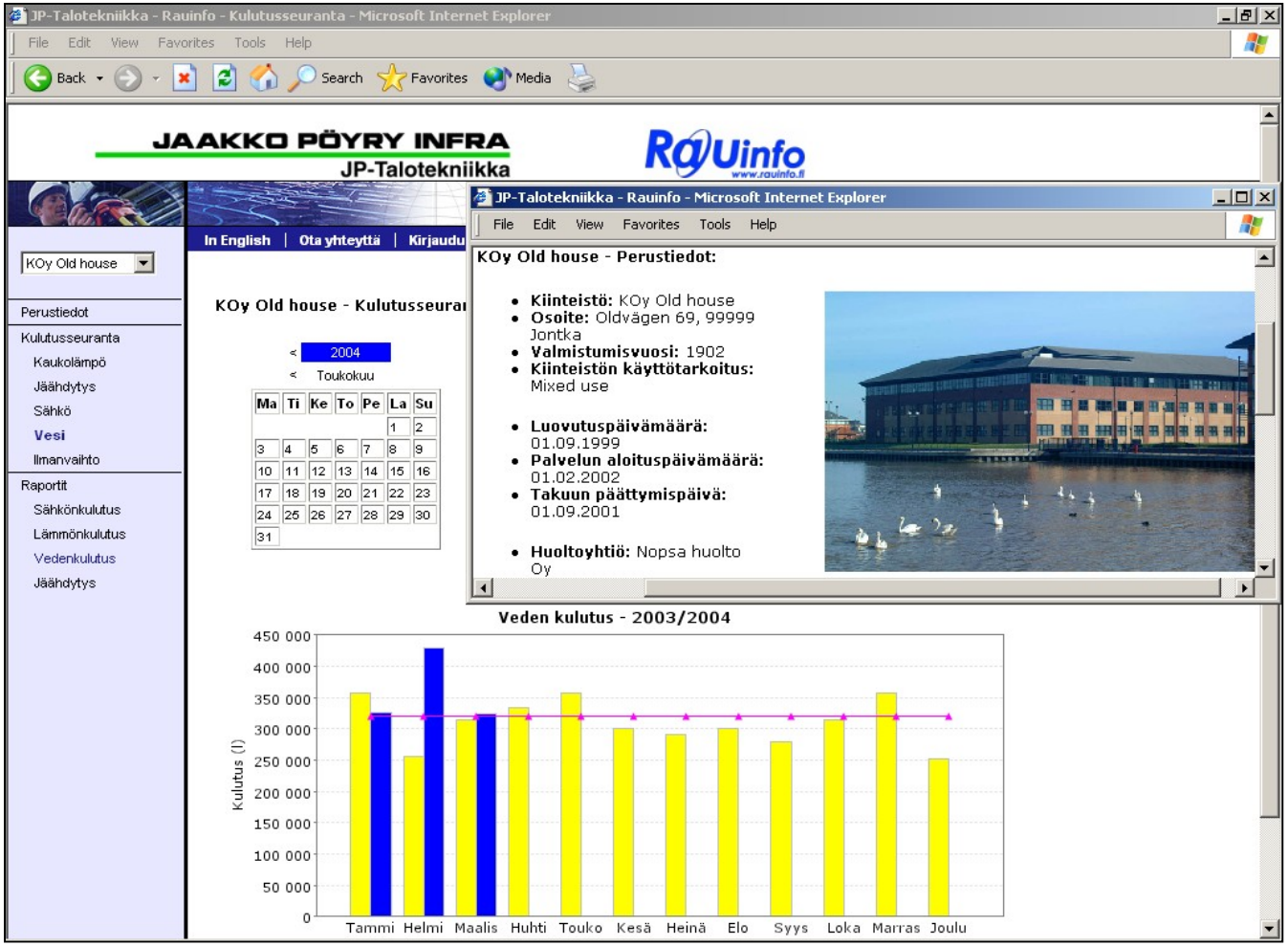
Service concepts

Market push

TEKES

CUBE
BUILDING SERVICES
TECHNOLOGY PROGRAMME 2002–2006

”A Reporting Building” – report formats for different users of information



TEKES

CUBE
BUILDING SERVICES
TECHNOLOGY PROGRAMME 2002–2006

PATENTED GSM CONTROL

Mobile technology

- **Measurements**
- **Infos**
- **Settings**
- **Time programmi**
- **Alarms**

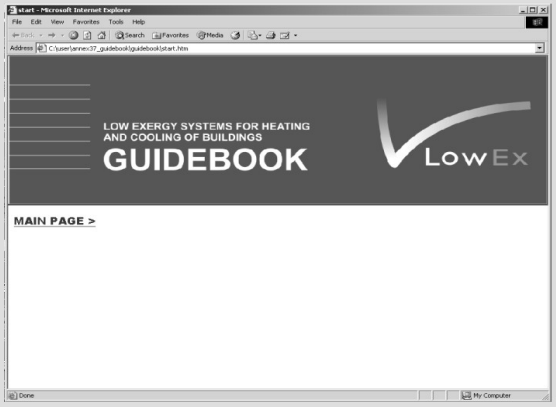
TEKES

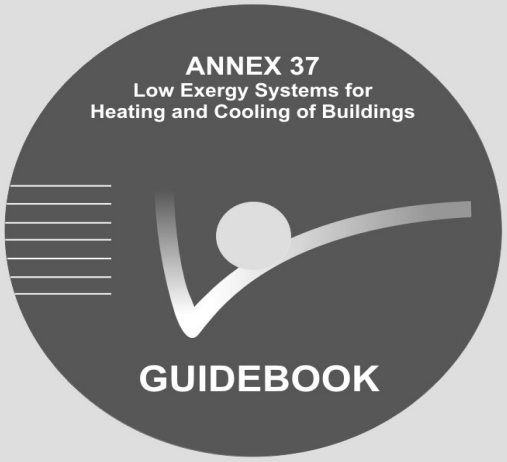
Mobile technology

Visual contact to the building object

TEKES

Low exergy heating and cooling of buildings
IEA/Annex 37/LowEx

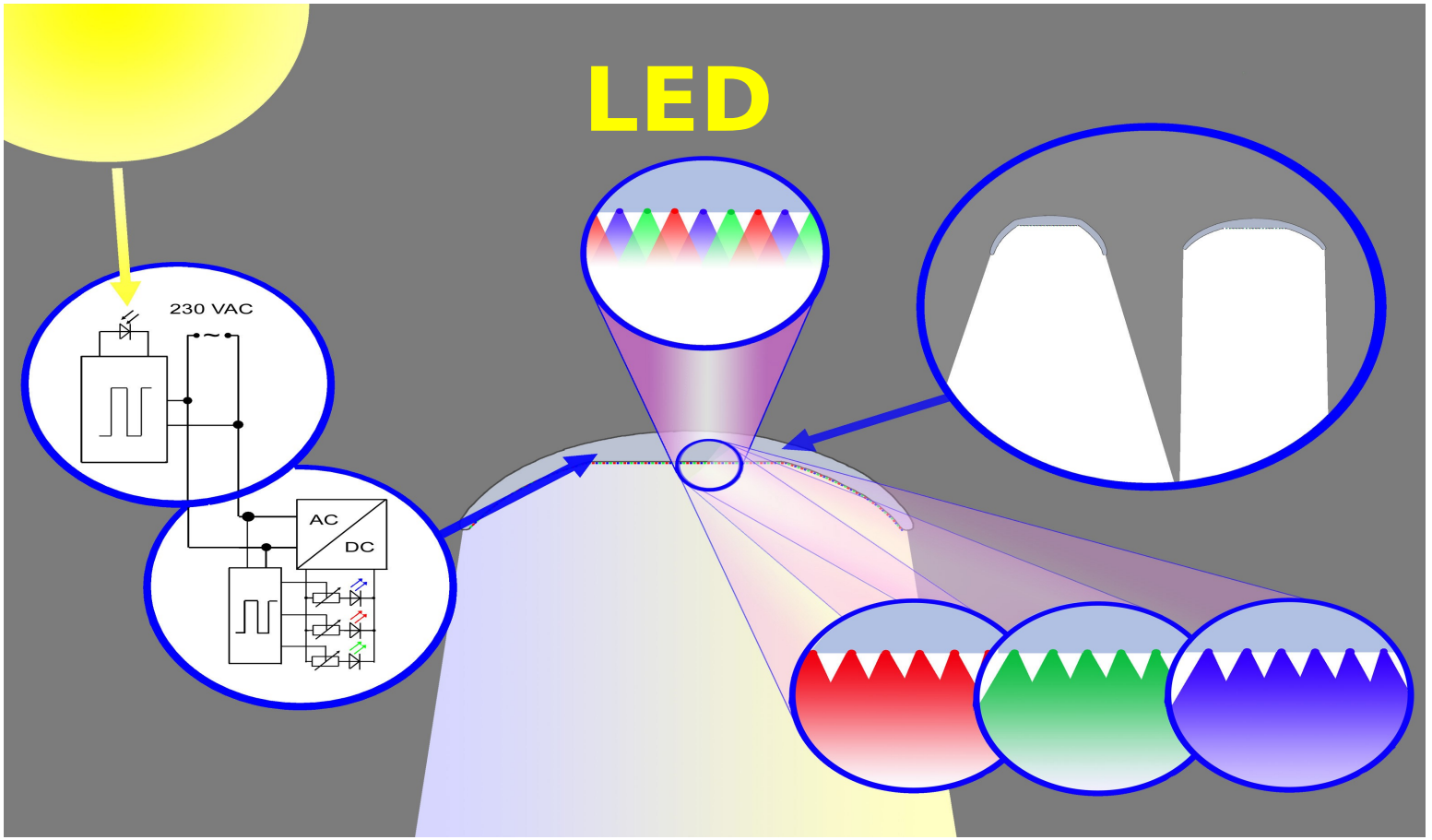




To be presented tomorrow

TEKES

Energy-Efficient Future Electric Lighting for Buildings/ IEA/Annex 45



TEKES

Thanks for your attention!

www.tekes.fi

TEKES